

for the Christian creed or indeed for any creed, which teaches the Being of God.

Yet the ideal of a perfected humanity is essentially a Eugenic ideal. For such an ideal Christians no less than Agnostics may look and work, even when they do not expect that it will ever be attained. For, the more nearly humanity attains perfection, the more closely will it approach the goal which Eugenists set before themselves; and the greater will be the contribution which human beings, as they perfect themselves, will make to the understanding of the universe, and therefore to a life more strictly accordant with the moral and spiritual laws of which the universe is the visible expression. It is difficult to see that Mr. Carr, in his honest and high-minded estimate of *The Changing Backgrounds of Religion and Ethics*, has thrown any stronger light upon Eugenics than this. J. E. C. WELLDON.

Goldschmidt, Professor D. Richard. *Physiologische Theorie der Vererbung*. Pp. vi+247. (Berlin. Julius Springer, 1927.) 15 gold marks.

PROF. GOLDSCHMIDT'S book is an important work on the relation of genetic factors to development, a branch of genetics which has so far remained almost unexplored, and from which much may be hoped in the future. The brilliant work of the Morgan school has established the chromosome mechanism of heredity; we are familiar with genes and with the characters for which they are responsible. But here is a wide gap to be bridged, for the developmental stages by which these characters are produced have yet to be studied.

Led on from his well known work on intersexuality in *Lymantria*, Prof. Goldschmidt has attempted to apply some of his conclusions more widely. In the present book he suggests that all differences between the action of factors may be ascribed to differences in the *rates* at which they affect the various processes of development. That this idea represents a notable advance in what may be called physiological genetics can not be doubted. It is certainly too simplified, and some of the details are open to objection on several grounds, especially chemical (see, for example, Fig. 18); but here we have a definite attempt to establish a relationship between genes and characters, and its importance can hardly be over-estimated.

An example will illustrate the type of evidence obtained. Goldschmidt and his fellow workers have shown that the development of the wing pigmentation in the Lepidoptera is brought about by a curious double process. The scale rudiments develop differentially, fore-shadowing the actual pattern. The various pigments appear to be produced in the body at different times, but can only be deposited in scales which have reached a certain stage of development. Thus the pattern is a function of the relative rates of scale differentiation and pigment formation.

The work deals essentially with the Lepidoptera. The initial disadvantage of using such holometabolous species for experiments on rates of development has, to some extent, been overcome by an interesting study of the larval colouration of *Lymantria dispar*. Goldschmidt has shown that melanin production depends upon a number of

genetic factors which control time-relations in the body. In this group the imaginal characters are, of course, fixed at emergence, as practically no growth or differentiation takes place after pupal life. The advantage of using ametabolous material (such as *Gammarus*) for genetic work of this kind is at once obvious, and may be compared to the superiority of a cinematograph picture over an instantaneous photograph.

The book contains a number of illustrations many of which represent curves of the type familiar to students of Prof. Goldschmidt's earlier work. It must constantly be born in mind that, in the majority of cases, these are purely theoretical, and do not represent actual determinations. This caution is particularly necessary with the curves illustrating the previous work, of producing stages of intersexuality in *Lymantria* by crossing various geographical races. Such curves merely illustrate the theory, for at best they can be determined only at a single point: the stage of intersexuality reached at emergence from the pupa.

Two additional hypotheses which Prof. Huxley and I have verified in *Gammarus* (Ford and Huxley, *Brit. J. Exp. Biol.*, in press), would greatly simplify his results; that (1) the time of onset and (2) the final equilibrium position attained are both genetically controlled.

No criticisms which may be levelled at this book can shake its fundamental importance. Prof. Goldschmidt has clearly demonstrated that Mendelian genes may be concerned with *rates of development*; a conception of special significance, alike for the student of Eugenics, Genetics, and of Evolutionary Biology.

E. B. FORD.

Gray, Alexander. "*Family Endowment.*" Benn, London, 1927.
Pp. 130. 4s. 6d. net.

"THE purpose of these pages," writes Professor Gray, "is to raise doubts, and to suggest that the question of Family Endowment requires greater consideration than it has yet received from those who argue in its support." The book, on these premises, must be counted a success. The propaganda for Family Allowances is certainly compounded, as Professor Gray says, of a medley of motives, some of them sound, *pace* the Professor, some of them irrelevant, and some contradictory. The movement may be said to be muddleheaded to a dangerous degree. Whether Professor Gray's philosophic rapier is a heavy enough weapon for the fight may be doubted. But the intelligent reader will enjoy the concise irony with which the "disinheritance" of Miss Rathbone's "Disinherited Family," bad as Anthropology and still worse as History, is probed and exploded. Still more pungent is the analysis of the claim made by the feminist section of the movement that a woman has only to bear a child to establish a right to a state pension. Such a right in the mother, married or unmarried, would entail very remarkable rights for the state as well. Of these counter-claims and consequential rights the movement would appear even now to be officially unaware. The State, indeed, would probably be driven to adopt eugenic methods and standards, so that the movement might still come to terms with the Eugenists. Professor Gray's